Turn Garbage into Gold
Composting at Home

Massachusetts Department of Environmental Protection

April 21, 2020

Why Compost?

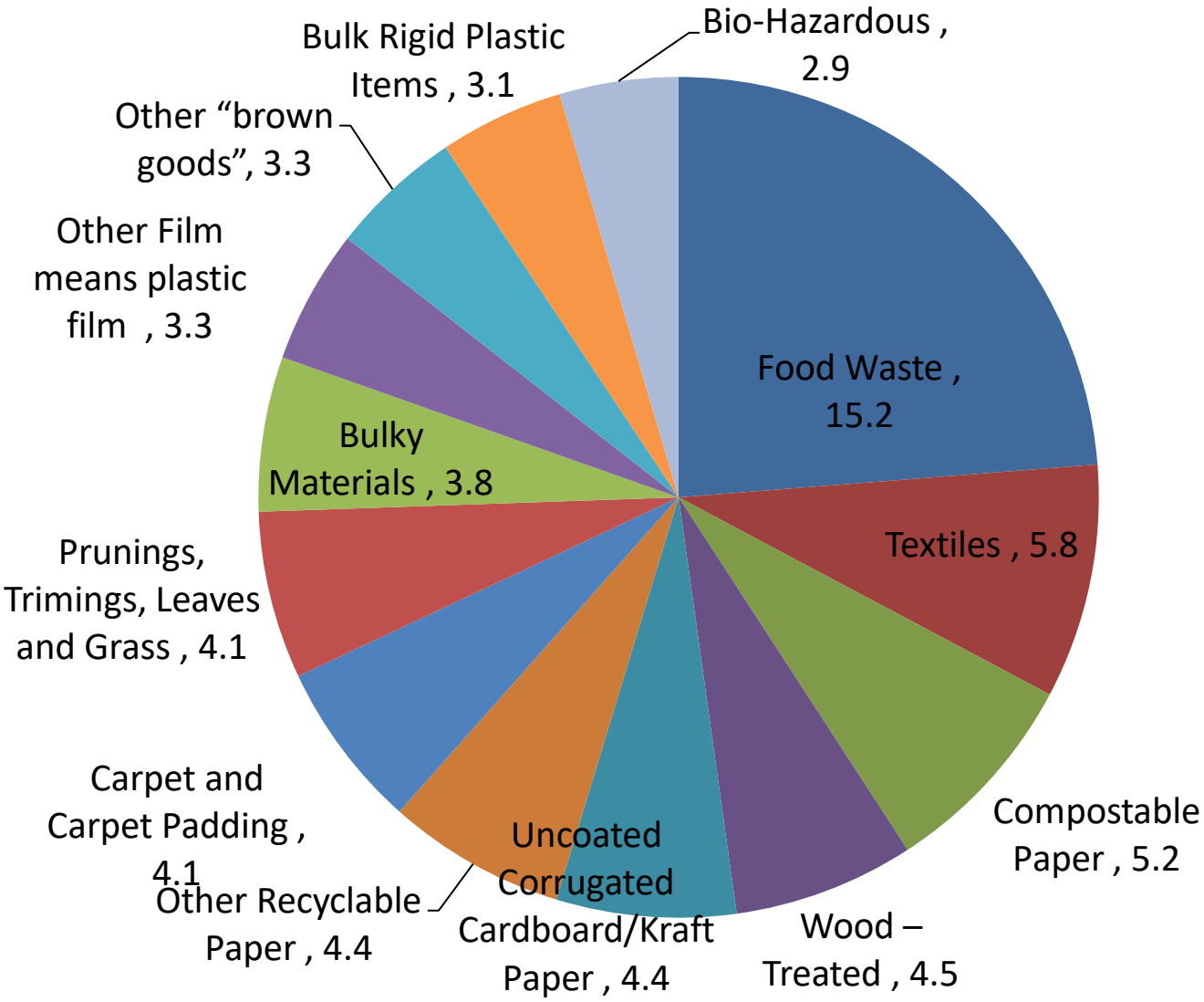
- Reduce waste requiring disposal
- Reduce greenhouse gas emissions (compared to landfilling) and sequester carbon in the soil (as humus)
- Recycle nutrients and organic matter for plants
- Saves money in avoided disposal costs and reduced purchases of soil amendment

What can be composted?

- Anything that was once alive, including:
- Food waste;
- Paper and paper products (paper plates, napkins, cardboard, coffee filters, etc.);
- Yard waste – leaves, pine needles, grass clippings, weeds, prunings, woodchips, sawdust;
- Manure
- Seaweed and the list goes on

but exactly which organic materials are composted depends on the composting system used.

How Much Compostable Material is in the Massachusetts Waste Stream? About 25%



How many ways are there to compost?

- Probably a million, including:
- On-site in bins, trash cans, buckets, worm bins, and piles
- Municipal and on-farm in windrows, piles or drums
- Commercial systems in enclosed containment vessels
- Aerobically, which produces CO_2 and humus
- Anaerobically, which produces CH_4 (methane) and happens inside our stomachs

Who can compost?

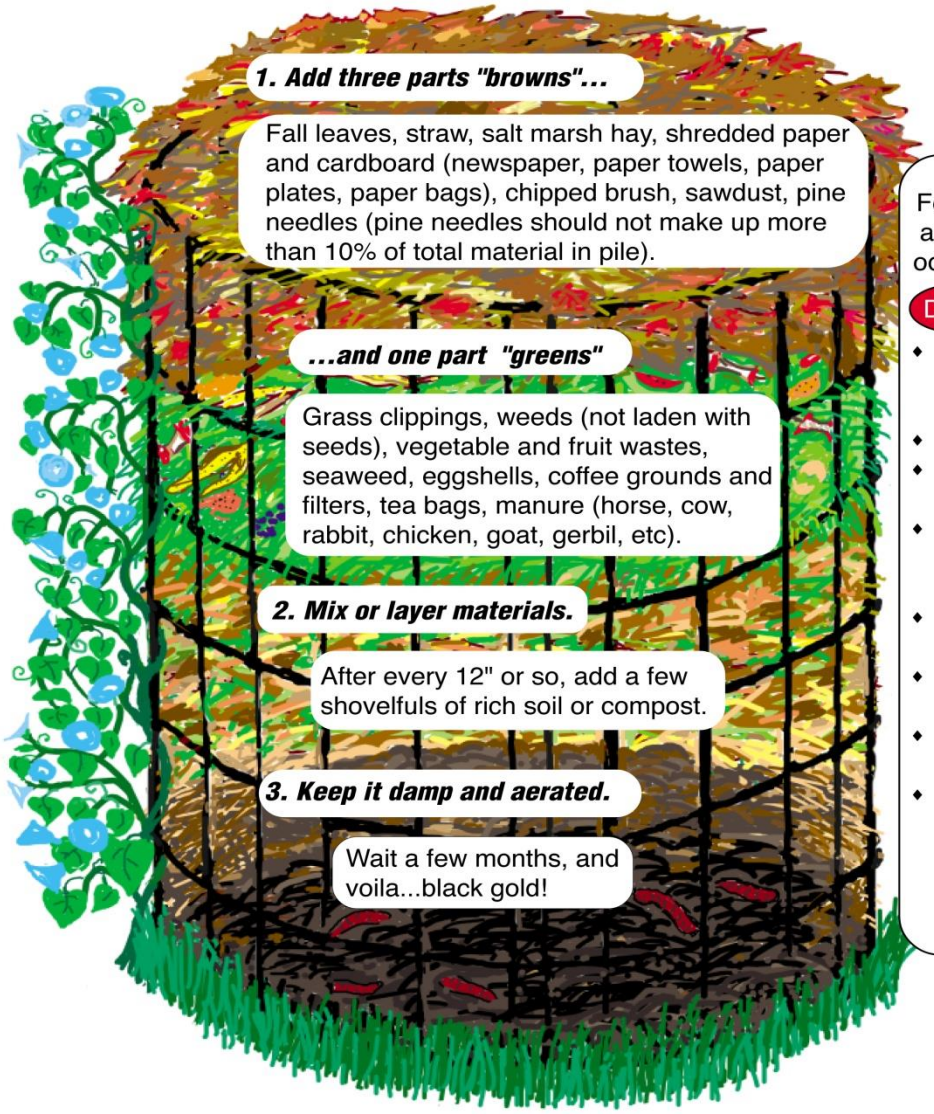
Everyone!

- At home
- At work
- At school
- At play
- On the farm
- In the basement
- On the porch
- In the woods
- In the garden

Why not???

Composting is easy!

To make compost, just follow these simple steps:



For best results, and to keep out odors and pests,

DO NOT ADD:

- Meat, bones, fat, grease, oils
- Peanut butter
- Dairy products
- Cooked foods with sauces or butter
- Dog and cat manure
- Diseased plants
- Weeds gone to seed
- Weeds that spread by roots and runners (vines)

Prepared by the Massachusetts Department of Environmental Protection

How Does Composting Work & Who Does the Work?

The other 99%! You want them to Occupy Your Bin!!!

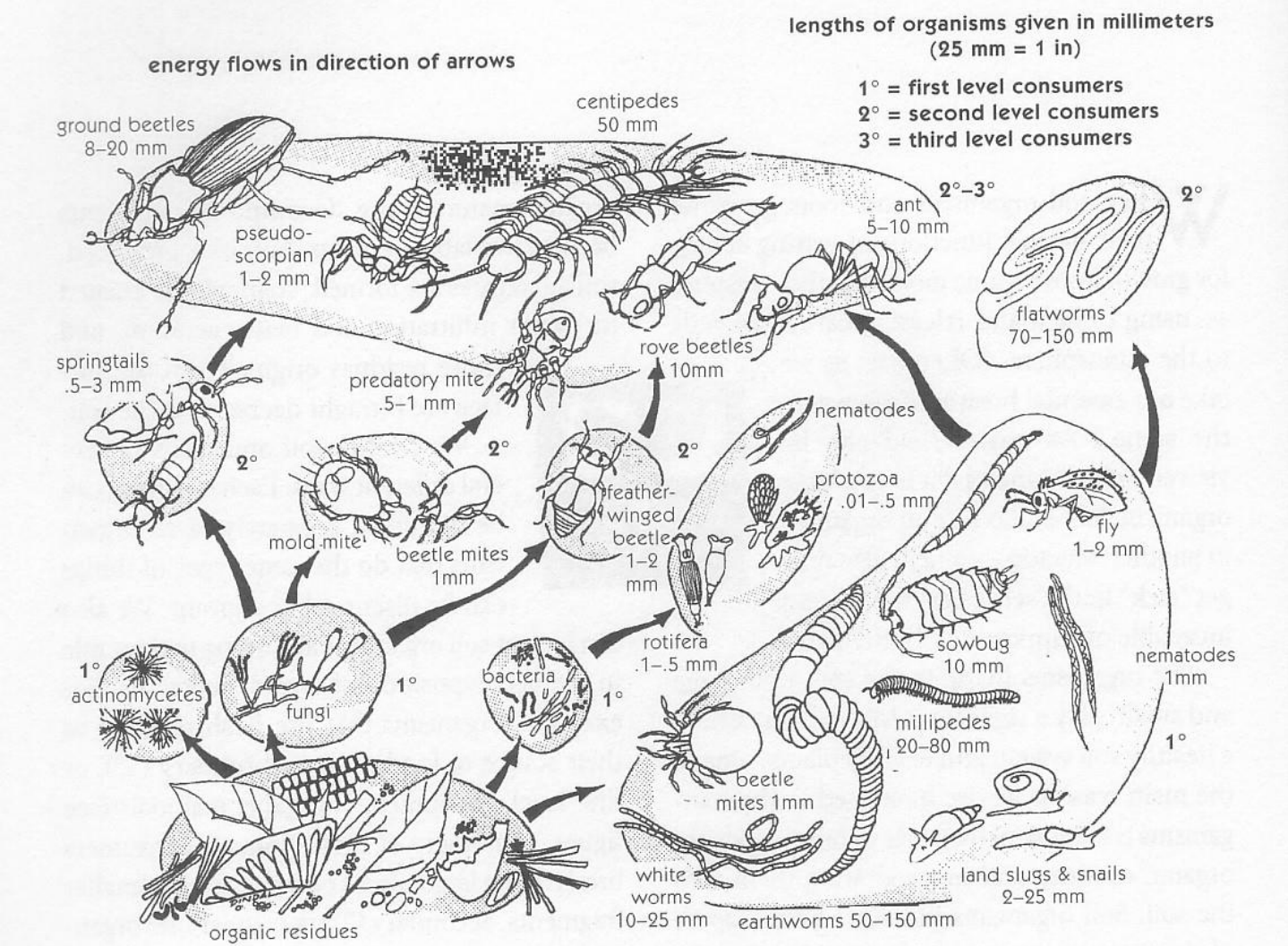


Figure 3.1 Soil organisms and their role in decomposing residues. Modified from D.L.Dindal, 1978.

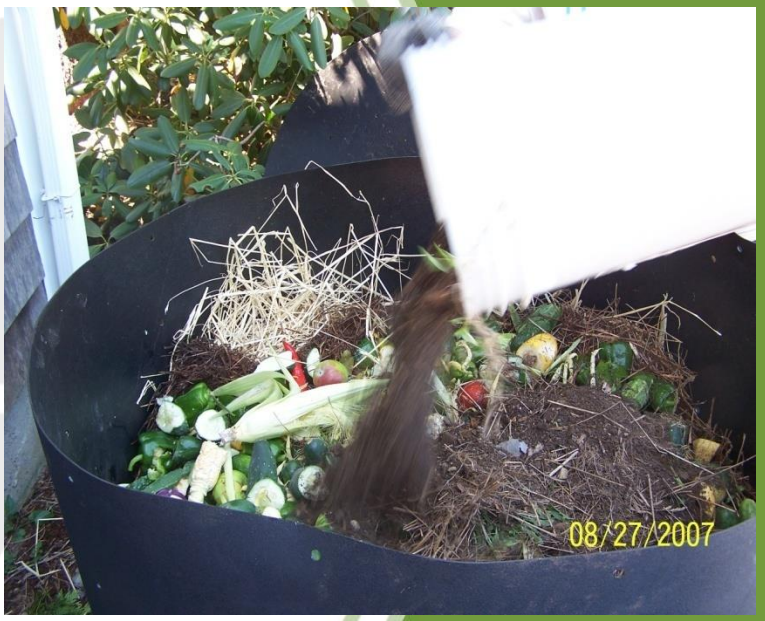
How to Compost

- Provide:
  - Food (carbon:nitrogen) (30:1 = fast, hot)
  - Moisture (50%) = Damp!
  - Oxygen (Passive or active – just do it!)
  - Habitable temperature (sufficient mass)

    (3’x3’x3’ = minimum to maintain heat)

Optional Ingredients

- Added bacteria/microbes (soil, manure, compost, commercial innoculants)
- Lime (have to be careful not to raise pH too much)



Do not compost these in a low-tech system:

- Meat, meat by-products
- Fat, grease, oils (in quantity)
- Dairy products (in quantity)
- Manure from carnivores (dogs, cats, humans)
- Large branches

Do Not Compost:

- Toxic materials – pesticides, petroleum products, chlorine, treated wood, etc.
- Trash – glass, metal, plastic

For best results, try to exclude:

- Diseased plants
- Weeds gone to seed
- Weeds that spread by roots and runners (vines)
- Invasive plant parts that can resprout

Do Compost: Clean Vegetative Materials

Sources of Carbon **("Browns")**

- ✓ Leaves
- ✓ Straw, hay
- ✓ Paper/cardboard
- ✓ Sawdust
- ✓ Wood chips
- ✓ Pine needles
- ✓ Dead, dried up plant parts: cornstalks, sunflower stalks, etc.
- ✓ Twigs

Sources of Nitrogen **("Greens")**

- ✓ Green plants & parts: (grass clippings, weeds, seaweed)
- ✓ Food scraps: fruit & vegetables, coffee grounds, tea bags, egg shells
- ✓ Herbivore manure
- ✓ Alfalfa meal
- ✓ Blood meal

C:N Ratio

- Responsible for odor generation
  - Odors can result from excess nitrogen
- Responsible for temperature and speed of decomposition
- Somewhat responsible for nitrogen content of end product

C:N Ratio of 30:1
Ideal for fast, hot composting

- Browns: may range from 40-700:1
- **Greens**: may range from 15-40:1

  Mix ‘n Match – Use your nose
- **Equal parts by weight usually means a higher volume of browns to greens because browns tend to weigh less.**

Recipes and Ratios

- Simple “Rule of Thumb” to achieve a 30:1 carbon to nitrogen ratio is to build a pile **using a mix of**:
- **3 parts “Browns”** to **1 part “Greens”**

  For example, **75% leaves** & **25% grass or vegetative food scraps**
- Can interchange other ingredients from the “Browns” and “Greens” categories.

1. Very high nitrogen material

2. Added cardboard, straw, compost and water

3. Added more cardboard

4. Topped off with hay

5. And covered

An easy way to get carbon into your compost pile is to collect scraps in a paper bag.

After dumping and burying the scraps, tear up the bag and leave the pieces on top.

Moisture

- Should be about 50%
- Balancing act
  - High Carbon materials usually dry, need moisture – rain, snow or a garden hose
  - If too dry, your compost will **not** decompose
  - If the leaves rustle when you stir, they're too dry
  - High Nitrogen materials are usually wet, need bulking with dry ingredients, like leaves
  - If too much wet food waste, the pile can develop odors – mix in some dry leaves, torn paper bags

Compost System

- Desirable:
  - Enclosed (if composting food waste)
  - Rodent-proof (metal, secure cover and floor and openings less than ½”) (if rodents are in the area)
  - Volume -1 cubic yard = 27 cu. ft. = 3’x3’x3’ = optimal size for efficient, hot composting
  - Built-in aeration system to eliminate turning
  - Easy to use for those who will be using it
    - e.g., if kids, it should be kid-friendly
  - Indoors if no yard, deck or porch

Compost Bins on State Contract FAC87

Vendor: New England Plastics

New Bedford, MA

508-998-3111

Bin-11: $51 (11 cu ft capacity)

Bin-24: $59 (24 cu ft capacity)

Bin-30: $63 (30 cu ft capacity)

Add $2-5 per bin plus shipping for orders of less than 21 bins

Compost Bins on State Contract FAC87

Vendor: ORBIS Corp.

888-675-2878 x7107

$49.50 (20-40 units)

$46.00 (41-100 units)

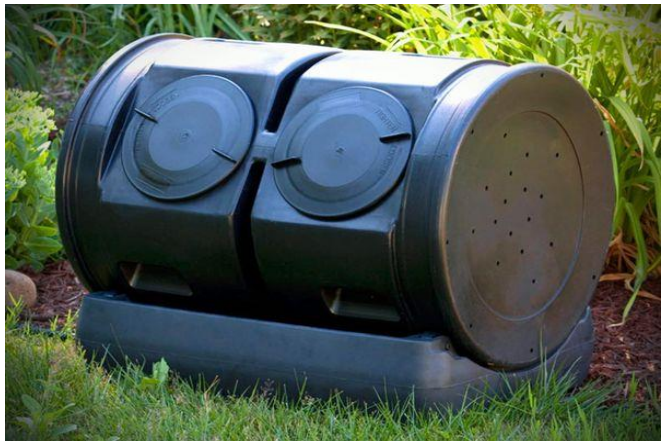
Minimum order: 20

Shipped in pallets of 20

10 cu ft capacity

Compost Bins on State Contract FAC87

Dual Compost Tumbler



Vendor: Go Green Solutions

774-293-1862

$153.99 (1-30 units)

$136.00 (31-100 units)

7 cu ft capacity (3.5 cu ft per side)

Where Should I put my Compost Bins?

- Space – how much will you need?
- Convenience – easily accessible
- Proximity to water source (faucet, not wetlands)
- Appearance - visibility (or invisibility)
- Drainage – no puddling or standing water
- Exposure – shade minimizes evaporation
- Environmental considerations – wetlands, buffer zones, proximity to the gardens or where the compost will be used
- Neighbors - avoid potential problems – out of sight, out of mind

Tools of the trade – gloves, a hose, cultivator, trowel, hoe, shovel and wheelbarrow or buckets

How do I get my compost? A simple way is to dig down until you reach it and scoop it into a bucket

Use a hoe or cultivator to peel the undecomposed material away, then shovel out the compost into a bucket or wheelbarrow

15 minutes later…

After harvesting compost, I planted Basil seeds directly into 100% compost. Make sure the compost is about a year old to make sure it is “stable”.

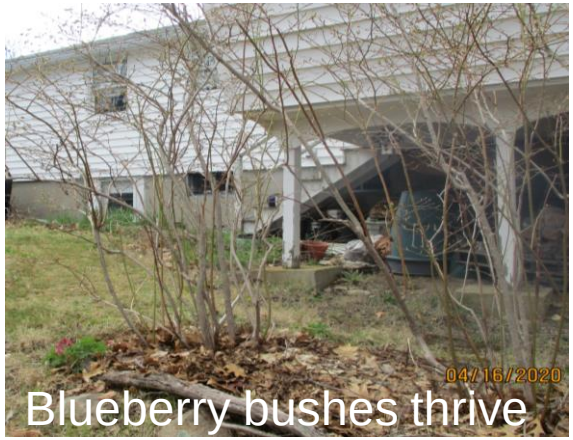
Compost holds water like a sponge, so don’t overwater the seedlings.

12 days later, here come the seedlings!

Using compost at 100% strength usually isn’t recommended, but I find it usually works out great!

Yard “waste” is a valuable source of organic matter for your soil – don’t let any of it leave your yard! Add it to your compost or use it as mulch! Nature will do the rest!

Burying coffee grounds into the soil under the leaf mulch around blueberry bushes



Don’t be afraid to mulch with leaves, even oak leaves. Your plants will thrive!

What if I don’t have a yard or other outdoor space? Try composting indoors by making a worm bin – no one has to know! (unless you want them to)!

Drill holes about 3” apart in sides of bin

Use torn waste paper as “bedding” (browns)

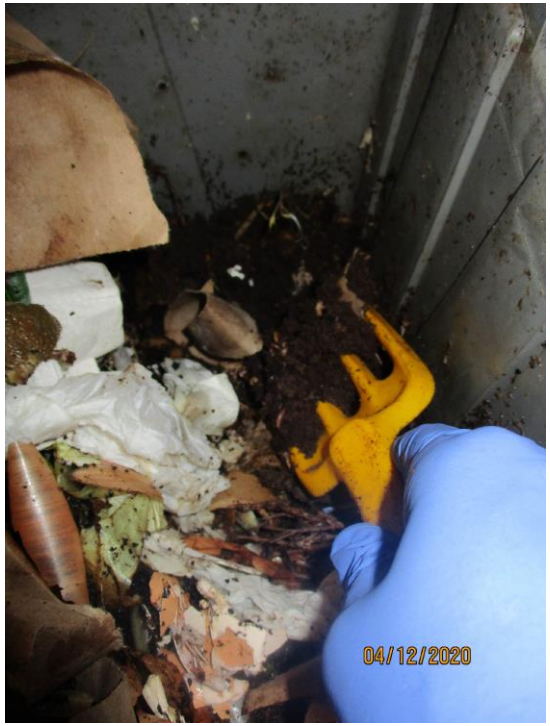
Add red wiggler worms – either collect them “in the wild” or order them by mail

Find red wigglers under damp leaves or old horse manure piles. Add 2 or more to start your indoor worm bin. Over time they will multiply, but won’t overpopulate the bin.

Young red wiggler worm on a wet oak leaf.

Add them to your bin with a handful of the humus or soil found under the leaves.

Dig below surface to bury food scraps



Keep a 3-4” layer of paper as a top layer

How can I prevent fruit flies in my worm bin or living space?
Here are some tips:

1. Remember **3 parts browns** to **1 part greens**, and always bury the food scraps under 3-4” of waste paper as the top layer of your bin; add more paper daily;
2. Avoid adding banana peels to your worm bin (add them to garden soil instead);
3. Freeze food scraps for several days, then thaw them out before burying in your bin;
4. Don’t overfeed your worm bin – add 1-2 cups food scraps per week to start. You can increase the amount added as time goes on, as the decomposition rate increases. If you can smell the food scraps, add less scraps or take a break.
5. Add more worm bins to your setup, if you have a lot to compost.

If fruit flies appear, stop adding food scraps (but keep adding paper) until flies are gone. **Make a fruit fly trap** – a container with red wine vinegar or banana peels attracts fruit flies and they can be released outdoors. Punch ¼” holes in the cover for flies to enter.

When you no longer find fruit flies going to your trap, you have won! (1-3 weeks typical)

Resources

Mass. Dept of Environmental Protection Home Composting Resources
https://www.mass.gov/lists/home-composting-green-landscaping

CT Dept of Energy and Environmental Protection Composting Videos
https://portal.ct.gov/DEEP/Waste-Management-and-Disposal/Organics-Recycling/Compost-Video-Downloads

Cornell University Home Composting Resources
https://gardening.cals.cornell.edu/garden-guidance/compost/

US Composting Council Residential Composting During Covid-19
https://cdn.ymaws.com/www.compostingcouncil.org/resource/resmgr/documents/coronavirus/sp_uscc_covid_residential_co.pdf

Wiggle Room Worm Composting Info, Worms and Supplies
https://www.wiggleroom.org/

University of Massachusetts Soil Testing Laboratory
https://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory

Books

- Minnich, J. and Marjorie Hunt. 1979. *Rodale Guide to Composting*, Rodale Press, Emmaus, PA

- Appelhof, Mary. 2000. *Worms Eat My Garbage, 2nd Ed*. Flower Press, Kalamazoo, MI.

Journals

- *Biocycle*, pub. JG Press, Emmaus, PA.

- *Organic Gardening*, pub. Rodale, Inc., Emmaus, PA.

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